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ABSTRACT

This paper reports the effects of one hour of extra post-partum contact between mother and infant on the quality of the attachment observed when the infant was one year old. It was hypothesized that infants in the extra contact condition would be classified as securely attached while regular contact infants would be less frequently classified as securely attached. Subjects were 40 mother-infant dyads who were observed in the Ainsworth Strange Situation. All infants in the sample were first born, Caucasian, and middle class. Groups were matched on years of maternal education and age. Each infant's level of cognitive development was assessed. Six undergraduate women alternated in the roles of stranger and observer. Observers gave narrative accounts of the behavior of infants, mothers and strangers. Accounts were tape recorded and transcribed. On the basis of the observer accounts, infants were classified as secure, ambivalent, or avoidant, using Ainsworth's criteria. Additional qualitative features of infant behavior, such as proximity and contact seeking, clinging, and turning away, were assessed. Results do not confirm the initial hypothesis that infants who experienced extra, early post-partum contact with their mothers would be more likely to demonstrate a secure attachment to mother in the Ainsworth Strange Situation at one year of age. Additional early contact with mothers did not influence either qualitative differences or cognitive development of infants. (Author/RH)

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Early Contact and Infant-Mother Attachment at One-Year

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It has been suggested that a sensitive period exists immediately after birth during which mothers are in a heightened state of readiness to form a positive affectional tie to their infants (Klaus and Kennell, 1976). It has also been hypothesized that early contact between mothers and their newborns, in the minutes immediately following delivery, facilitates this process of mother-infant bonding. On the other hand, the practice, prevalent in many hospitals, to separate mothers and infants immediately after delivery, may have adverse effects on the developing mother-child relationship. With this in mind, several recent studies have examined the effects of early, post-partum contact on mother-infant interaction (for reviews see Campbell and Taylor, 1979; Klaus and Kennell, 1976).

Within this context, the term bonding is used most often to refer to a rapid process, occurring immediately after birth, which reflects mother-to-infant attachment. Bonding is seen as being facilitated by physical contact between a mother and her newborn infant through skin-to-skin contact, suckling, mutual visual regard, and fondling. The quality of bonding is studied in terms of specific behaviors which are assumed to reflect that "bond," i.e., affectionate behaviors the mother shows toward her infant, primarily touching, eye contact, holding, and caressing. Research and theory on bonding are particularly associated with the work of Klaus and Kennell (1976).

The term attachment on the other hand, has come to refer to a hypothetical contruct reflecting the quality of the affectional tie between infant and parents, especially mother, which develops gradually during the first year of life (Ainsworth, 1973).

Thus, both bonding and attachment refer to aspects of the affectional relationship between parents and infants. Bonding is primarily unidirectional (mother——→infant), rapid (within the first hours or days after birth) and facilitated or optimized by physical contact. Attachment, on the other hand, is reciprocal (mother←——→infant), develops gradually through stages during the first year of life, and is mediated by psychological variables such as the quality, timing, and pacing of adult-child encounters.

It can be argued that the establishment of a strong mother-to-infant bond immediately post-partum should facilitate the development of mother-infant attachment during the first year by sensitizing mothers to their infant's cues, and thereby, enhancing the quality of the mother-infant interaction. However, research, to date, on the effects of extra post-partum contact has examined frequencies of specific affectionate maternal behaviors (e.g., Klaus et al., 1972) which have been found to vary as a function of the extra or regular contact experience. However, it has been argued, notably by Sroufe and Waters (1977), that it is the quality of the reciprocal interaction between mother and infant that is central to our understanding of social development and not the frequency of occurrence of specific behaviors. With this in mind, we reasoned that if extra, post-partum contact is to influence the quality rather than the quantity of mother-infant interaction, this should be reflected in the quality of the attachment relationship observed at one-year. Indeed, we see the quality of mother-infant attachment as one crucial outcome variable in the study of the effects of extra contact on social and emotional development.

The attachment relationship as conceptualized by Ainsworth (Ainsworth, 1973; Ainsworth et al., 1978) is characterized by differen-

tial responsiveness, particularly when the infant is under stress. Further, stress leads the infant to seek contact with the attachment figure and the infant derives comfort from that contact. The mother or other attachment figure serves as a secure base from which the infant explores. Additional features of attachment include some protest at separation and greeting upon reunion. However, as Sroufe and Waters (1977) have pointed out, the quality of attachment cannot be inferred from the amount of clinging or the intensity of separation protest. The securely attached infant, sure of mother's return, may not protest at separation, but will acknowledge her return and actively seek social interaction with her.

The Ainsworth Strange Situation (Ainsworth and Bell, 1970; Ainsworth et al., 1978) is a standard series of episodes frequently used to assess the attachment of mother and infant; it also provides an excellent illustration of what is meant by the quality of attachment. In a standard sequence of episodes the infant's reactions to a new environment, a strange adult, separation from, and reunion with mother are observed. This standardized laboratory situation permits comparability across subjects and also highlights separation and reunion behaviors more clearly than do naturalistic observations (Sroufe and Waters, 1977). During an initial free play period with mother present, it is possible to assess the infant's use of the mother as a base for exploration by observing the infant's ability to engage in play and exploration of a new and interesting environment. The appearance of a friendly, non-intrusive stranger permits assessment of the infant's social interaction with a strange adult with mother present, as well as the infant's reaction to the stranger when mother has left. The infant's behavior when left alone and his/her behavior upon reunion with mother are also observed.

Three general patterns of attachment have been described by Ainsworth and replicated by others (Ainsworth et al., 1978). The securely attached infant tends to explore the environment and show interest in the stranger when mother is present. Her departure leads to a decrease in exploratory behavior and decreased interest in the stranger who may or may not be some source of comfort. However, securely attached infants show clearly differential behavior upon the mother's return. They clearly greet her either by running and clinging, by holding out their arms, or by smiling and vocalizing. They settle reasonably quickly once reunited and resume their play. Ambivalently attached infants may or may not explore the environment and show interest in the stranger. The main characteristic of their ambivalent behavior is seen during reunion with mother when they show a mixture of seeking and resisting contact with her. An angry quality to this behavior has been noted as well. Mother avoidant infants tend to resist contact on reunion and to be less distressed than other infants when left alone with the stranger. Behavior toward the stranger is less differential than that shown by secure or ambivalent infants.

These patterns of attachment at one year appear to be related to the quality of mother-infant interaction throughout the first year of life. Maternal responsiveness, acceptance, and cooperation are associated with secure patterns of attachment at one year. Similarly, ambivalent and avoidant behaviors are associated with a greater tendency for mothers to be more insensitive, less accepting, and more interfering.

The present study examined the effects of one hour of extra post-partum contact on the quality of infant-mother attachment at one year. It was hypothesized that a greater proportion of extra contact

than regular contact infant-mother dayds would be classified as securely attached when observed in the Ainsworth Strange Situation at one year. In addition, a measure of object permanence was administered to infants since a relationship between quality of attachment and cognitive functioning has been demonstrated (Bell, 1970; Matas, Arend, and Sroufe, 1978).

Method

Subjects consisted of 40 mother-infant dyads whose continued participation in this longitudinal study included a visit to the psychology laboratory at the time of their first birthday. So far, 8 regular contact females, 7 regular contact males, 9 extra contact females, and 16 extra contact males have been observed in the Ainsworth Strange Situation. The mean age of the infants at the time of observation was comparable across groups ($\bar{X}$ ages - RC females: 12 months, 17 days; RC males: 12 months, 20 days; EC females: 12 months, 16 days; EC males: 12 months, 12 days; $F < 1$). As noted before (Taylor et al., 1979), all infants in the sample are first born, Caucasian, and middle class. Extra and regular contact males and females are also matched on years of maternal education ($\bar{X}$'s = 14.77, 13.63, 14.00, 13.71, respectively; $F < 1$).

Fourteen mother-infant pairs were lost to follow-up, 10 regular contact and 4 extra contact pairs. Of these 6 moved, 4 could not be reached, and 4 dropped out of the study.

Procedure: The Ainsworth Strange Situation procedure was followed exactly (Ainsworth and Bell, 1970; Ainsworth et al., 1978). All sessions took place in a 9' x 12' playroom with a one-way observation room adjoining it. The experimental room was carpeted and furnished with two chairs and a collection of toys.

Six female undergraduates alternated in the roles of stranger and observers. All were naive to the specific hypotheses under investigation and blind to group membership. Both the stranger and the mother were given typed instructions in advance explaining their role in the procedure, and told to wait for a bell which would signal the beginning and end of episodes. Mothers were told that the purpose of the procedure was to observe how their baby reacted to short separations from his mother. It was explained that episodes in the procedure were similar to the kinds of separations that infants experience, at home, such as being left with a babysitter, or being put in a playpen while mother makes dinner. All mothers were reassured that should their infant become too distressed, the episode would be terminated immediately.

The eight episodes of the Ainsworth Strange Situation are summarized below:

Episode 1: (M, B) -- Mother (M) carried the baby (B), into the room and placed him/her on the floor near the toys.

Episode 2: (M, B) -- M sat quietly in her chair, playing with B only if he/she sought her attention. Duration: 3 minutes.

Episode 3: (S, M, B) -- A stranger (S), entered, sat quietly for 1 minute, conversed with M for 1 minute, and then gradually approached B, showing a toy. At the end of the third minute, M left the room quietly, without saying anything to the infant.

Episode 4: (S, B) -- S tried to interest B in the toys. If B was distressed, S tried to distract him/her or to comfort him/her. If B could not be comforted, the episode was curtailed--otherwise it lasted 3 minutes.

Episode 5: (M, B) -- M called B's name through closed door, then entered, stood in the doorway for the count of 5 to allow observers to see if B spontaneously greeted mother. S left unobtrusively. M was not given directions as to what to do in this episode, except that after B was settled in play with the toys, she would be signalled to leave. She was to pause at the door to say "bye-bye." (Duration undetermined)

Episode 6: (B alone) -- The baby was left alone for 3 minutes unless he/she became so distressed that the episode had to be curtailed.

Episode 7: (S, B) -- S entered and behaved as in Episode 4 for 3 minutes, unless the infant remained distressed, and the episoded was curtailed.

Episode 8: (M, B) -- M returned, S left, and after the reunion was observed, the situation was terminated.

The subject permanence scale from the Uzgiris-Hunt Scales of Infant Psychological Development (Uzgiris and Hunt, 1975) was administered to subjects after the final episode of the Strange Situation when the child had once again settled into play with mother in the observation room. Mothers remained in the room for this part of the procedure. The object permanence scale is a Piaget-based measure of cognitive development, similar to that used by Bell (1970) which showed accelerated development of object permanence in securely attached as compared to non-securely attached infants.

Measures: An observer gave a running narrative account of the behavior of infants, mothers, and strangers. This was tape recorded and transcribed. On the basis of these narratives, infants were classified

as secure, ambivalent, or avoidant, using detailed criteria supplied by Ainsworth. The first author was present for all observations and classified infants at the completion of the observation. The second author independently classified 31 infants on the basis of the transcribed narrative alone. Inter-coder agreement reached 85%. Disagreements were resolved through discussion.

A second measure was based on the 7-point rating scales developed by Ainsworth to assess additional qualitative features of infant behavior as follows:

1) proximity and contact seeking-e.g., approaching, signalling, clambering up
2) contact maintaining-e.g., infant clings, holds on, resists release
3) proximity and interaction resisting-e.g., squirming to get down, pushing away, hitting
4) proximity and interaction avoiding-e.g., moving away, turning away

At least two naive observers coded infant behaviors on these 7-point scales with 1 indicating minimal occurrence of the behaviors in question and 7 indicating marked occurrence. Pearson correlations between each pair of raters for each behavior was high (mean r = .948).

Results

As can be seen in Table 1, the distribution of secure, ambivalent, and avoidant infants did not vary systematically as a function of the extra or regular contact experiences ($\chi^2 < 1$). Moreover, the distribution of infants across attachment classifications was highly consistent with the normative data reported by Ainsworth et al. (1978), as can be seen in Table 2.

Infant behaviors were also rated on four 7-point scales designed by Ainsworth to evaluate specific proximity and contact seeking behaviors as well as resistant and avoidant behaviors. For the purposes of this presentation, only ratings of behavior directed toward mother during the second reunion episode are reported. Infants did not differ significantly on these measures as a function of sex or contact group, although means on the scales of proximity seeking and contact avoiding are in the direction suggestive of the sex by contact interaction reported for the one month feeding observations (Taylor et al., 1979). Means and standard deviations are reported in Table 3.

Object permanence scores did not differ among the groups as a function of sex ($F < 1$) or early versus regular contact ($F < 1$). However, consistent with Bell (1970), the 29 securely attached infants had a higher mean score on the object permanence scale ($\bar{X} = 7.75$) than did ambivalent and avoidant infants (N=11, $\bar{X} = 7.09$). While this difference did not reach statistical significance (t=.73), infants who received higher scores on the object permanence scale showed a trend towards higher ratings on proximity seeking ($r = .25$, $p = .06$) and lower ratings on contact resisting ($r = -.20$, $p = .10$) and contact avoiding ($r = -.25$ $p = .06$) behaviors during the second reunion episode.

Discussion

These results do not confirm the initial hypothesis that infants who experienced extra, early post-partum contact with their mothers would be more likely to demonstrate a secure attachment to mother in the Ainsworth Strange Situation at one-year. It appears, on the basis of the data collected so far on 40 mother-infant dyads, that qualitative differences in infant-mother attachment cannot be attributed to early experiences post-delivery, as they were manipulated in this study.

When these data are examined with the earlier feeding data in mind, there is some suggestion of an evanescent sex by contact interaction. Our one-month data, consistent with de Chateau (1976), indicate that extra contact mothers and their infant sons engaged in a smoother, more harmonious feeding interaction than extra contact mothers and daughters or regular contact dyads irrespective of sex of infant. The data from the ratings of infant behavior in the Strange Situation at one year were mildly suggestive, though if indeed an effect remains, it is clearly a weak one. Furthermore, cognitive development as measured by the object permanence scale also failed to demonstrate an effect of extra contact.

Thus, the findings to date, do not support a conclusion of long-term effects of extra contact on mother-infant interaction or infant cognitive functioning as examined in this study using well validated and standardized laboratory procedures.

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Table 1

Distribution of Ainsworth's Strange Situation Attachment

Classifications by Contact Group

	Secure	Avoidant	Ambivalent	
Extra Contact	19	4	2	25
Regular Contact	10	4	1	15

$\chi^2 < 1$

Table 2

Percent of Infants Classified as Secure, Avoidant, and Ambivalent in Comparison With Ainsworth's Normative Data

	Ainsworth et al. (1978) N = 106	Current Sample N = 40
Secure (B)[1]	65%	72%
Avoidant (A)	21%	20%
Ambivalent (C)	13%	8%

[1] A, B, and C reflect Ainsworth's letter designations of attachment groups.

Table 3

Means and Standard Deviations on Ainsworth's Scales of Infant Attachment Behavior and on the Object Permanence Scale by Sex and Contact Group

	Regular Female N = 8	Regular Male N = 7	Extra Female N = 9	Extra Male N = 16
Proximity Seeking	4.33(2.55)	4.29(2.21)	3.89(2.31)	5.50(1.26)
Contact Maint.	3.44(2.07)	3.86(2.34)	3.75(2.30)	4.69(2.18)
Contact Resist.	1.56(1.33)	1.43(1.13)	1.88(1.36)	1.56(1.26)
Contact Avoid.	2.00(2.00)	2.43(1.62)	2.25(1.58)	1.38(.81)
Object Permanence	7.78(1.64)	6.50(2.51)	7.50(.76)	7.88(2.13)

[1] Behaviors directed towards mother during the second reunion episode.

Note- Main effects of sex and of contact group failed even to approach statistical significance. There was a slight trend for the sex by contact interaction on ratings of proximity seeking to approach significance ($F(1,36) = 2.51$, $p = .12$).